NOVEMBER 1943 50 CENTS PER COPY

# VIATION

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IN THIS ISSUE

LET'S BE CALM

ABOUT THE HELICOPTER

Too much ballyhoo can ruin

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FEEDER AIRLINES IN POSTWAR AMERICA

 An analysis of problems and realistic appraisal of the future by a veteran operator.

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Defeat Manager New York and Boyler, Sahari E. Boyer. Richelelylon. G. A. Aksen and E. M. Scholimager. Chrolinal. A. H. Steitgh and E. O. Wayner. Scholl. C. W. Intell. Chinage. A. E. Manager. and W. H. Asmari. In: Applic. E. W. Stein. San Francisco. John Difference.

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AVIATION



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AVIATION, Number, 1943

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AVIATION, Number, 190

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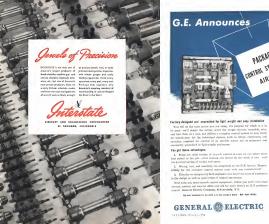
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Controlon graving holds these holes to a taircase of .002. The range of sizes is from  $\chi^{0}_{1}$  (Av. 22. Cleves Boll) up to 1° diameter (A.-16), lengths from 50° to 7°. "Naprosal" makes milisers of Clevis Bolts for Arm and Davis alters, to a high standard

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"SPITFIRES" AND "HURRICANES" CLEAR THE SKIES OVER BRITAIN IN 1940 The Battle of Britain is endorsed in Churchill's immortal which Windowser is partly penal. In 1838, Watchester engeneers took to England the designs and anotherary for Made of gure copper, with walls only 5/1000ths of an each thirt. Wortheast Reductor Tolers, therein in Worthes.

assembled that she'r enlive easter surface in carling seen. PINCHETER RAINATING TO HEE RESSET COMMONNA. DASY SURFING. Pure coases, Windowsker Cortisles If WOUNDED THEY QUICKLY ILY AGAIN Pictures below how how to replace Minchaster Corridge Core Tubes should they be manufaced in soline as by according They

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Altroduction of Clear Wicker Window Glass, Bannapane, Scialed Rate Gress, Sci-Sus, Golden Flass, Vandine, Virelay, Thermolay, Sure-Glass, Gentone, Sort Absorbing, Optical and every other decreative and specialty pleases. WEATHER OR NO... it's a tough job at best...this business of bombing, but around the clock it must conif we'd shorten the path to victory and it's during the attery hours of dark ness,... or when fee shuts down that cetting horte in safety depends on accurate radio casy confarement from within the thin ELECTRONICS DIVISION Rough Clourker ...

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Moking its limit as the family random of the feture is a new type of aircreft ... a over that can lead as a toward, or home indefinitely over one good, the helicoptes, he possibilities are already shallenging six-The propeller or rotte revers on the weigh producing ... in wor work. When the wor in peer, it will be available

blades must be escentionally strong, yet light in shads of vertical leadings. The moternal specified for the construction of helicopters, therefore, must result weer and impact, and consider from weather and works, while maintaining a high strength-weight ratio - consider.

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is proving its efficiency. Our requestions stell will glidly study year special leading problems.

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### THE CECOSTAMP SOLVES NEW METAL FORMING PROBLEMS



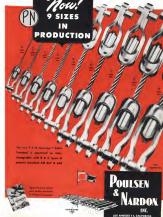
THE rower short matal ferming problems passed by the needs of the absents industry included the need for a means of ferming tougher, more clusted eilery obests in clearwar dis impressions without tearing, wirakling or reduction of section, to account limits without mismatching, and of speeding the production of

The Geosettery was designed by Chambersburg to meet and solve these problems. How well at his does as is indicated by the fort that practically every sheets the manufacturer in the United States, and many of the most important cores in the countries of our Albis, are using Geosettempo for the production of alloy sheet result area.

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EVER WATCH a gooden under at work? It's no beauty And because of its meshquithle energy, it often

completes on entire web in 30 or 40 number. This highspeed production regulate extraordinary coordination of all 8 leas as the unider balances and oxides the to regular a satisfar arress with envir On one Job, a 2%" Winks Congregate In 12 seconds per mece con-

on econatric hole without stopping the spindle. Onenon economic necessity - in wortises, a military necessity. That's why the Cone Multiple Speedle Automotic Lothe, one of the key production machines of people time industry, us of such vital importance to warring. In the same to come Core Multiple Smidlle Auto-

duction 10 times faster than is possible by many cretods now in use affect that Lake As the often will help at the weather of dispussor a lead of wester,

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were "elementary" to the man so the fore and all it.

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mere thoroughly into the curr of things. In most observed later though their surpose else.

A modern Sherlack, Halmer in the RCA Electron To

With the difference. Shothed, meant model after the evine. The clothese labe in the division is the magic bean that detects merceoper flow, in wis little in few they can rape

res" For with the sid of this device, poor and with an BCA deor Take, a tary flow as a write can be also messed eachedly-

The re-development is action near-ret DCs.

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Good Pattern, There Camparence is Assess Gooden, New Joseph, There Camparence is Assess Species "Asses" Book June nor show, betanby ngl 7 to 3, Econor Sur Fine, Else Artenal.









# The Fledgling Has Grown His Wings



Fens's Avistian Paris Praduction was only in its inforcy at the short of the war, but now the findigiting has grown its wings. It's on its own ... FENN ARCART DIVISION . . . with its own plant of New Britolis, Cannecticus. Fern Aircraft is hooded by a capable staff of engineers and produc-

tan mar, well versed in tool design and tool engineering. Farty years experience in precision manufacturing to class talerances is babiled this stell.

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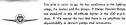
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Compressed in a handy splittler, ready to go to week at an instead's notice, lives a reighty gazzi—exmed Cachee Decode, A contision only 3%s by 9% inches bolds 42,000 feed-pounds of energy-assemble at

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nashed to the same of the main course, there are no ports h

Model Pl-D-24

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The causes or wast is the only charge. The organization, policies and management are unchanged. The ownership is wholly American. The company continues its license to manufacture Down "Low-Line" byloude news and "Leonal Sustained Issuing cur. The growing

his of products not exceed by Boutz patents made the change of page desirable. HUR products now include . . "Lies Live" hydroxic pures, hard pures, pror pures . . . DIC year year turnet acquaine budwelle some . . "Levered Supersons" budge ever . . . Louding grar for Bell 7-39 Assession . . . Vackers type olso stret for Asserofien Boudset bombers . . . Landon gear for helicopters . . . USAAF experimental track landing gree . . . Landing gree for Floring R37 Short street to file . Filters . . exercisestal accret, established and

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AVIATION, Neverber, 1947

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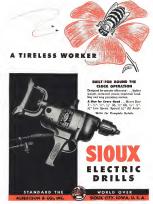
\* To the oversee verses, there's outhably nothing startling in the appearance of most arcraft fittings. But, someon who has worked with intricate metal parts-say, a watchrealor-would see usus nel things in AFCO Fittings.

He would notice that the threads are as clean and sharp as a bound's tooth, free from the chaser marks which betray larged production . . . that the noves are smooth as elass, not marred by careless charming into machines. Raising an AFCO Fitting to his eye, he would discover inside holes are perfectly reamed, concentric to outside threads by a few thousandths. Perhaps the mirror finish would take his eye, too, for AFCO Fittings are not only exercisely Apolized, but also handled and packed to avoid scratching the protective coating-even to the

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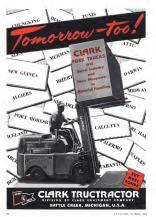
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down-hovers at any height. It can drop a upce It can deliver breakable supplies and Medied to relative quiet, it can perform madern fathern and bembers. For notificy, billey - proved to combat service - signs







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Ma motive how dray over word, Sevenance Mulgar Milling Contra do the job of finalizing faster and closeer them one of other type and relative faster and closeer them one of other type and rainty leaf. They take deep, shape just him and can be recompilally regionard access of ment, in celdition to Judy jusped colorers. Sevenation "Cachida" Religin Milling Cortens are also now writefalled in a well response of shapes and affect. Cachida" Religing Cortens are also now writefalled in a well-amply of shapes and since. Cachida or services are recommended or entered in other nativative having on extremely hard, otherwise, such. Wires for contrasting hard, otherwise, such. Wires for compilers facts to both how Services Mulgar facts to both how Services Mulgar

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Place to Burbani, Colifornia and Humbroton Wast Va. grafe, will give you immediate deliveries of \$1361 fine. supported as and blocks. They're the standard of the industry because ADEL processed in this field, designed, reflered. S'porty says: simplified and improved ... pat for meets but for years, Bested on every bottle frant, used by every see ADEL for quick service major U.S. and Cornelina about comsees. Over 110 million now in service 12,000 anadastics types and describe off structure was vite means in simple by of contribution know wer edge of maintenance, low cost uploses. Ask our necret engineering service office for free cotalog. "not on condition ADRIX, alongs bear in mind that it is about a safe but to see what athers by to indicate PRECISION PRODUCTS CORP. Emlast Centenna SUPPORT OUR BOYS

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AVIATION, Number, 1948





BRYANT CHUCKING GRINDER CO.



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ALCOA GALUMINUM AVIATION, Number, 2543

### To meet EXTREMES



## Free Enterprise

WHAT IS IT? HOW DOES IT WORK?

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South Bend, Indiana

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#### Headlines-Or Education?

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Jeslie E. Vierles

#### America at War

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#### Let's Be Calm **About the Helicopter**

By LOU LEAVITT

Overwhelming publicity—much of it not even helt-behad—threatess the retery who elected: A cure of "the much and ten colch." His transpelling will creedly rule the prospects of the creft, says this veteros test pilet-unless the trumpet is muted.

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BY JAMES & DAY Tim Provider, Stationar diverse As evieties veteras whe's actually operating feeder lines analyzes particular evolution on the book of practical experiences and really. ticelly exercises the future services which can be rendered.

In Postwar America

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#### Design for Survival By JOHN FOSTER, JR.,

Aircraft producers' biopest problems can only be solved by Cenmercional authorizable the halo of the industry book. A service devices is excitable, but a his marries remains. Will existing give

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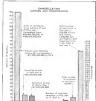
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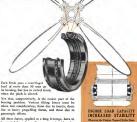
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# Over 50 Tons the weight of two flying "FORTS" N EACH BLADE BEARI



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nley loads with freedom of action, but without a hint of backlash. On your bearing propeller feathering problems comple The Timbern Roller Bearing Company, Conton, Obio.

TIMBEN



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AVIATION, Number, 1961



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AVIATION, Secretor, 1962.









AVIATION, Number, 1943



Engine Control Achieves

Simpler Piloting By WILLIAM J. MORRISON A. P. FRAAS

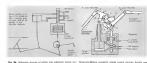
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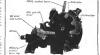
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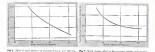
The B.F. Goodrick Airplane of the month GRUMMAN HELLCAT WATCH THE HEADLINES as the same. We're proud that Silventown Time, De-

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"Hellest" at written igno the history of Scorp. Bullet Senting Puel Cells, and many reading for everyone but the Axis. For one of these planes, the land or on a carrier's deck. And like its





# B.E.GOODRICH RUBBER RESEARCH FOR THE

#### HE'S SHOOTING HOLES IN A HOSE ... TO HELP BRING OUR FIGHTERS HOME

TY'S A mighty apportunt bose be's showing as and all marker imporhose is the vital lank between an airlink whose failure due to bullet puncrarys, shell fearments, or any other crew. That's why be wants his 50-calabre



Back in 1941 was when B. F. Goodrich first hegen producing belief-scaling feel hors, following conve tion consisted of an Ameripol (synthetic rubbet) cover. When associous nemeroused the rabe thought

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MAKERS OF B. F. GOODRICH TIRES AND OVER 10 RUBBER AND STRTHETIC RUBBER PRODUCTS FOR AIRPLANES

#### THERE'S AN EFFICIENT B.F. GOODRICH HOSE FOR EVERY AIRCRAFT APPLICATION



mass sealing efficiency, this bose meets latest Army and Navy fact under 10 to 15 pounds pressure without leaking

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In war or peace

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6. Only the registrate in the N. F. Goodrich Decision

a. Other materials are more american.

FREE! Pecket-size broker on Quiter Servicing and Installa-FIRST IN RUBBER B. F. GOGORICH, AERONAUTICAL GIVINGN, AKRON, G.

#### **Prescriptions for Head Cracks** In 24ST Bivets

By F. C. HAPTMANN, C. F. WESTCOAT, M. W. BRENNECKE

Laboratory tasks of strengths, correctes resistance, heat transcents. and enline of elects also a five-point saids to new efficiencies in their employment is aircraft.

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Fig. 1s (right). Ores section of same river, midway of break

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TABLE IS-Effect of Sun of Driven Hand on Strangth of Single Strated 2427 Lop Joints Media Wife to in 2457 Streets All given-thouse McChaeld in O.194 in below. Springed of now temporaries agong below debring it and largery of come increasing agong below below. I will, Take obsents in previous of section of the below.

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different conditions of soudested our





Rg. 2. Effect of head marchs are shour falligner strongth of 1 in 1987 electr. All tests made with complete averaged of stones, and all believes by alarm, except an autod.





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#### Manifold-Solenoid De-Icer Systems With Electronic Control

By M. I. TAYLOR and W. E. FOND, Asset fortune

Plats have only too well that les doesn't form is my stondardized fashion. But whatever the rate or menner, this highly Serible de-lear control system is designed to early any Icing condition encountered.

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#### AIRCRAFT PRODUCTION ANALYSIS **Key to Assembly Line Efficiency**

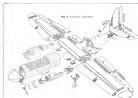
BY LOREN F. DORMAN, Andrew Draw Crawer,

With the expert of hope number. Gospiete detailing of 1942's thorough line-production breekdowns

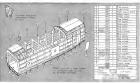
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AVIATION, Number, 1941



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Fig. 7. West leading class



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Use Assembly Pleasing

AVIATION, November, 1942



#### **Analysis of Members** With Variable Moments of Inertia

By YYES NURAE, feel former's Green

Presenting in concise and ready form essential data and characterletter for analysise marshers with version memoris of heatile, including general expressions for slone defaction equations, front and memorts, stiffness and carry-over fectors, and three memort casations. A s a statue of moreoungly emples

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superchanger is to his cause. Policies of either in first. Toenther, they make nominis the high-allitude failter pleases and bombers that are playing so commissions a part in to-

In the use of anti-friction bearings in superchargers, as to so many other systics applications, NORMA HOPFMANN po-Murma-Auffmann neered the way. The terrific reseds of appearbancer countries -often an bigh as 60,000 RPM -demond that DUTE-PRECISION BEARINGS PRINCIPALITY IN CHARGE CONTROL OF HORMA HOPPMANN BEAR. PRINCIPLON REARDINGS are done their part in whose air represented for the Albed Air Payors in every theaten of war. "Where the bearings MUST NOT Sull"-In engines, control mechanisms, sustrements, armament, radio oppionant and other siccraft accessomes-they are providing that combina-

tion of speedability, load expecity and dependability so wital to the unfelling performance of the place. Let our envisore such with some

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place, reducation. Seen any 14th y grown

#### Plant Power-Minus the Bottlenecks



By W. D. DRUMMOND, Industry Special When vitel wer production must be maintained day in and day out. power and lighting emergencies become intelerable. So Wright's Obio angles plant called for an electrical distribution system that weeld be dependable-seles. Here's how that order was filled.







Durket 440 v. power sufficienced in plant administrate data and tree all streets



terber in 200/100 v. Sighting overall-board. Traiget rest mounted outdoor power and Spinor tunderner entractor.

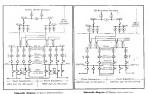
AVIATION Number, 1949.

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comfort are never men-a set of "comfort inis another "comfort again"-measures the pelative roughness of the six, ambeing pilots in herping to the smoother flight levels . . . and the sensitive altimeter being them margine.

and assignfion-civil and military-Kollaman

IN THE PASSINGER PLANES OF TOMORROW.....



#### This Plant-Within-Plant Assures Peak Production

"Little CV" selvenes, fires, and builds anything-quickly sips preduction flow laws before they see begin. Making the unsued normal end emergencies routine is the perticular banch of this miscellaneous parts deportment, and the maxim of its skilled steff is "Name it and you can have it."



















AVIATION, Number, 1945





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These are no ordinary forgings. Their end use is crucial, Their production must be flawless, document hoor pressure in

especially imperative, because allowable variations from specified hardness are extremely small in these vital parts. At controls over enery heat treating step to assure the best possible grain structure. And we do it in step with streeting, arrend-

out difficult abroingm and stool forming with securingly impossible precision and prospenses. We shall welcome LOUISVILLE, KINTUCKY

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#### Noorduyn Production Time-Savers

By JAMES MONTAGNES

How now "Itwists" speed up "Herverd" and "Mersonne" autout.





Teach chames falour stored of thomb sorve







and her supporting the heavy tool makes the work light stough





# These Four Great War Planes Show How Lighter, Stronger Tires Now Carry As Much As 50% More Weight

HOW "II S " TIRE ENGINEERS ANSWERED THE NEED FOR TIRES THAT CAN TAKE THE INCREASED WAR LOAD . . . WITHOUT INCREASING TIRE SIZE







center of war activity, the Consolidated Liberator



Army Ave four exand thene of our Allies Is has proved as hadles realized feel cells served of slamspare make, with greater stocks of gas and amounts on and added plane with the Acres and Nava are acres, decreased over weights.

ron for the place and prior Bullet-scaling hel cells, over replaced herever comes over that could not has made the might of American air power felt with Even with a 59% increase in lead, the 56" are see Energy, have become the replical of deadly, long range In 1940, the Fortress landed as 43,000 pounds on the raw said has been secremed only slightly. "U.S." are weath increased. They carried the land over reach landay fields at higher and higher speeds. Then come U.5 Revals with Nalon budges delevating 64% more

menhad in large quantity by "LLS" to the Army Air Bocco. ECCHEPTURE CENTER - NEW YORK 2D. N. Y



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What the faters holds for synthetic rubber is not yet fully known. Yet this much is certain. When the war is

was, the knowledge we are gaining every day through the use of all these synthetic robbers, above and with narran leables, will make proceeding products, whether free for your core, belts for your indexer, waterpread factories for your dishress, or gashole have for your service station, better and more recvireable than they have now how hofes.

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METION'S GODEST STOCK PILE OF RUBBER IS STELL THE DED ON DID FART AND TREFFEL CONSERVE WORD TREES!

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#### VISION UNLIMITED.

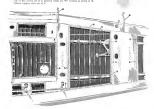
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serined cabins, and other vital parts and devices, but we are Department, the Engineers Come, and the U. S. Nave. "Coffing Unlimited" is the pilot's signal that the far burious of the sky are visible in every direction "Tistee. Unlimited" is combolic of the continuous forward process. of Presstite engineering and research.

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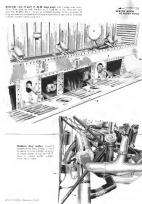
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JACKSON, MICHIGAN, U. S. A.

VIATION Normber, 1949









#### Magtag Hydraulic Cylinders Feature Rugged Simplicity

The property illustrated is being used today By record simplicity is typical of Marrian hydroulies...s simplicity resulting cylinders are different. They measureste distinctly unonce unnearlies of construction

contributions of its engineers in the field

Mayter also produces Eclasse electric retracting units ... shorozom alloy

THE MAYYAS COMPANY, NEWTON, IOWA







SHEET NUMBER CLASSIFICATION 

#### Mechanical Properties Of Plexiglas

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#### Mechanical Properties Of Plexiglas

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AND ATTON, Symmeter 1947

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Proof of quality and dependability is in performance. Wilrox radio equipment is installed on major Commercial airlines throughout America, and in ad-





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#### Where Are Those Dividends?

By H. L. PEDERMAN

#### Paucity of cash-ner-share returns may puzzle the questioning layeren. but a check of the elected industry's famound history existly shows there's so mystery about it.

Down emblated scores in our causas the pattern. The Avantas

TABLE I-EARNINGS AND DIVIDEND PAYMENTS OF MAJOR ASCRAFT

(Source Standard & Poor's Aircraft DEVELOPMENT THE

TABLE IS—BARRON'S STOCK

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(Turn to page 282)

the Timetables of INVASION Corne Commercia . . . because an accelerate the tigactables of arrestm. Today those erect show see exaltly supported Communication performance in this new phase of wiferer relation has proved to effective that the your facilities in four of its hour plants for the wer glasts . . . the world's largest twin-expined CURTISS-WRIGHT CURTISS FOR CARGO AND COMMERCE











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#### See why we build em fast? At all these major loses and active - abor armed with heavy machine, on a resolution schedule, devel-

NEW SSINIA

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a tough, isse, versatile, single envine

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If they always the woman congues are more. We



Your machine, regardless of how well designed and equipped in other appointments, gives the best performance only when operated with cutting tools designed for the job.

As a natural consequence of mosting and solving many machine problems in milits, logerated has developed a line of miling cathers in types and sizes to sait the condition of the work. These isclude cattern for face-miling, and miling, side milits, sletting, cherealing, slabbing, form-milling, and many types of borlow.

If you are not cetting satisfied with the performance of your mechines, investigate their tooling.

One example of how you may benefit is described at the bottom of this sase.

In stating the conditions of your work give [1] Kind of material being out. (2) Writh and depth of stock removal. (3) Nature of cut, such as face-milling, stotting, atc. (4) Type of machine drive.

19. And if accommiss a sixth of the well-incommission of the condition of the section of the sections.

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Today's war takes floors to many streams skyments. But it was western day's pieceers who bewed out the besis sirweys excempening them. Told here is how England poinstokingly launched prower air restee ever the "Berk Coefficient and beyond"-that laying a patent corner-

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By early 1931, the African roote by













#### Make Your Reservations Early





#### Nater Related Air Class recovering crops, shed procreptors she's, overall she's, and regard that what touch on a few recents whether many constant to exclude

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#### They battle the enemy with bombs and bullets

#### ...they baffle the elements with VALSPAR

Scourse of the seven seas, "Buccancer", the Navy's Barwager Bomber, reams on with other "Corsur"-in carrying the fight to the enemy

uncessingly No igus constant is the darly bittle assume the compling action of word, water, see and see Metal though it is, the revolues dain of finheiroships needs a feash that feath off the fary of the elements, and comountage to foil searching CHCKEY CYCS.

Broomy finds Valenting's Values Val-Acroformities that finish very sandactorily, says-











and at Change Tricking ambles porce

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they have two offices on the waiting



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UAL "wavering" method awhither trifle regarding certain trips be personnel societated to handle super on these flatter. The view of New York often shows shocks with trap resident





#### WHERE PLANE TRAFFIC IS RUSIEST CUNO FILTERS PROTECT ALL FLIGHTS

1981 toler-offs and lendings in one week at the National Airport - where three leading sirlings, American, Eastern, and Pennsylvania Central, converge

on the notion's countal. Rosey plane was checked - and every plane was found equipped with Cuno Filters, assuring constant flow of clean fluids to vital parts.

Cure was the first, you know, to develop filters for positive, uninterrected removal of sludge in siroraft engine lubeleation. As a result of continuing collabcratics with acronoutical designers, other arresult fluid systems, such as hydraulic control, supercharger lube, and glycol heating systems, are now also

Today, most engine and sircraft builders use Cuno Filters because they provide non-stop protection . . . because their dependability has been proved by millions of miles in the sir . . . and because the maintenance problem has been reduced to a minimum.

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of presinces aviation engineers. Mounted on the fitter is a tiav hydraulic motor powered by the oil it below to keep dram By blades which positively comb out all imbedded as well as adherent solids - exponentic protection assignt sludge and undestrable

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LONG-LIFE ASSURED

Was imprograted, wax filled reporter Carnette Rature 2.0-05-03 mild Power Factor, 67 1000 cycles At maximum Resistance - 2000 more how per marrief and Distriction 1" depth-21/4" length-21/4" height

A small part in victory today-A BIG PART IN INDUSTRY TOMORROW ATTATION, Number, 1981.

#### How AA's Propeller Shop "Keeps 'Em Turning" By EDWARD E. THORP

MAINTENANCE

A single, comprehensive step handles all propeller everteels for AA's actionwide system. Detailed here are the practic means by which airscrews are maintained at top efficiency.

RELEASED OF LETTERS, all propolate door is much that exceeding and horizontal results of the content and horizontal results and the content an headed and removal at the company's. To record the first hours of the sushops at LeCourts Field, X. L. By page and propellers, a pleasing board (incorpring the west more lightly (Fig. 1) is used which deserve species

nuthed of recting the propellers on for Arbury.

are bracked in a shop 60 th x 60 ft , the Fig. 2. Storage wheat leafs by American





#### DESTRUCTION ... made to order

AMONG ALL the missiles may be contrived to hard doub at his No other projectile to so complete, so expelvilly engineered, so "tenda to coder" for destruction. Drawing the deadly "warhous," it as astronto

The tropedo is one more illustration of the fact that there is no more vital factor in the mechanised war we fight today than and fromen becomes. They Bierally make possible the automated action of New Departure is making hourings by the term of millions. In fact New Department has a major responsibility in the whole bail bearing war production sources.



MOTORS TO ALL LINE A RAW \*\*\* \*\*\*\*\*\* /\*\*\*\*\* \*\*\*\*\*

Fig. 4. Trim break when Mades are incomed on other Fink or



check is here on this short of but and blades. Person in left and

the board in placed a short of cellulard. Deposit in this case, 600 be in white possibility of the remanced bases and on foreign with two rays of boles for you spinced when the engine or peo for hopes than the specified time with

will be wouldy resembled of the stetue the point empaypoiding to the symbols \$8 in abviews that there can be



NEW DEPARTURE - STYLLIGH OF GENERAL ACTORS - PRISTOL, CONNECTION



Fig. 4. Floor pice of propeller step.



Heds Resting

(Form in page 270)

Fig. 5. Costing of Moons and party Fig. 7. Betweeley stead and bleds resk.







There is a size and type LOUIS ALLIS every industrial requirement.







# Let's first WIN this war!

We won't ever have a second chance-

The Gerjaps are waging a vicious determined war—
a cruel fination! war to kill, conquer and loot their
focs—a war of no quaeters and of no conspecusio
— either we defeat them—or they will conquer us!

And unless HE win—meither us nor our children!

children will ever hore a second chance.

We here at Louis Albis are foreign our every effort in every way to help win this war — to get it over as quickly a remaible.

Our engineering development department has created many outstanding — perhaps revolutionery — improvements in electric mater design — construction and performance —

Motors that are serving a major important role in helping your boy and mine win this war — to help hring him book looms — safely — as quickly as pos-

Many of these important new motor developments will also play an important rule in the post sear period.

But now is not the time to discuss them --- let's first WIN this wor!







MAINTENANCE NOTEBOOK

American Propeller Norman Vascal

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VITATION Street, 191











Fine American Lugier Overhead Steams

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any to merel where desired, Score jo ches keeps the steed from rolling.



# Proud Wings for the Ryan Manifold

Rvan Exhaust Systems control and conheat of the rouring exhaust fire of those Byan both designs and foolds well in arrested by this facts. The employer on most successful entires; and commercial of other improvements, refriements and nytems problems, are now common from the Ryan development section. felds, turbo-superchanger insulfations. dampeting and other specialized exhaust development groups now serve the Army,











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Obleach & Southern Collador Bearr

Stores Products Co., is driven by Black & Decker and





#### remember The Horse-Shoe

Nail? "All for the west of a horse-shap will . . . " So must the old story of hottles and portions thing. In today's lastiles - with history's course desending mean

make might.

An important part of a fassour British run carrier is the use which holds truck merican together. This madern "hereabor anti" most stend up under punish tion years and the engineers of Victor-Peninsalar Division of Alicel Products Corresponding houses experiments to coldtough problem: Nearly 19" long, the essentiandened on had to be kept per-Alfred's experience and specialized oppresent relved the problems. Now suilage of there pine hearing the

#### the Albed-made pine raised the life of ALLIED PRODUCTS

the most more than 10 times? CORPORATION DITROIT AND MILLIDALS, MICHIGAN

TITIE AN ALLIED BEADURET Albed Products Corposation - procision machine puris for sirveds, punches and Affini's skill, experience and hardstorn,



#### "THUNDERBOLT-WORLD" The "Thunderbolt" was considered for one versions.

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#### Canada Trains Them By Tens of Thousands

By JANET R. KEITH

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use: Typical of such motors is that above, with South American Movemed exching \$6%.



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... But the Consolidated PHY Petral Bomber turns - Mangaverable? Road in today's papers about sale up a freely nose at the wind-owept waster and fog- struddling bombs, oil-shrin, or enemy transports

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or Equator . . . the "work-horse" of the Nevyl

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of seace. The Fafair Bracker Conveys, Aily coult Division, New British, Connecticut.



#### Piloting Big Bombers Is Big Business





From Deleting Command's Toward Field, Inter Delevator was 20 ton of place East, two, Jide, and ade successes,

Nine weeks in cockpits, closses, and machaels's averalls won't make n fear-reasing pilet. A runs also has to have the executive's skill for presented plus "the ebility to think of 50 things of ence."

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#### AVIATION, Mempler, 1943

#### PV-2 Helicopter Makes First Public Flight

NYING EQUIPMENT

New croft sold to be free of vibration and flatter characteristics through full operation range, including cruising speed of 65 mph.

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AVIATION, November, 1843



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#### Production of Precision Aircraft Devices

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these devices call for light weight coupled with environ-Foots Book engineering experience and manufacture

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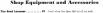
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The Washington Windsock

By SLAINE STUBBLEFIELD

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\*The Hours Front" is a daily feature at the Los Angeles Train. The foregate or company from this color of the Los Angeles Train. The foregate or company from this admit and happened dept 6, 1943. These Traines is Lossily a "not conded" was correspondent whose colorful explain on many from the loss of the manufact. Nature of the DCJ also applies to the CCF Skytten and CCF Skytten CCF Skytten and CCF Skytten a

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(Contained from page 123)
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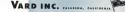
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AVIATION, November, 19

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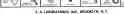
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AVIATION, Numerice, 2022





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 $H^{ow}$  does at happen that Martin, long famed  $_{o}$  of tarties. Martin engineers, stelling ways to case for the contracted factor, solvered these results. The source factor, solvered these results. The source terrets and burlt America's first for their PRM-1

Most-Productor Gen Terrets To give U.S. bombers a pulverising much and to

NAMES WALLOW or partied by these twin 10 s in the Margin

world's located manufactures of power-operated mag was cast as a single tent . moving assembly sensi pun meres? As for back as 1937 Martin Tites were perfected . . and the "chassis" of the parted borsher. When, an 1940, General Arnold borb electrically and hydraulically powered are

New Improvements Hardly a week passes without changes or improvements being made in Martin terreta, to keep well

provided for guerrers and so namerous other









### ...and in the minds of America's millions

Wierre viewer serv lack angued. take a look at these. They're specialses, Infancy, Signal Corps, Tanks, Rauger-Paratrooper-Eachimportantinbuttle.

No one expects the infantymen to our slag the tank garner. No one expects the Surral Come to out-firly the Range. America knows that more is "best"-eather that each will do his job and do it well And feally, into the minds of America's millions has penetrated the parallel that

can be drawn in the sky. That there is no "best" similane, but owher a right similane for every job, every social every stringle. every degree of lead or firepower that Victory demands. Sizes September 1942, Roshlang has used the pages of the national macrimes to tell this story in detail-to explain how the

averaft made by each American manufacturer is considered to do its specific job and We have that in some weall new these

messages of ours have helped America to brown its debt-to the receast the El S. must never forget.

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CARROL - CO<sub>2</sub> Systems with Enterone five Estinguishing Surfacements A<sub>2</sub>Undermity of City theretical sales Exchange in the surface with smilarity contentration of the

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AVIATION, November, 2003.



Operating Characteristics

Alfand's "C.S." Council Differential Balanceses developed to do in very small space and with specificability or inh for which there were no standard soleys swedsble. Its design and production was a critical test of Allind's shifty to originals where publics on the market and

"C5" is enteresting in its class differential and dependability-if gives managem conject capacity with small operating power-it care be weed in polyment common and it is extracted

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### "Aviation's next job is to help the common man! on how V. Totale Descript of Proc Assessor World Assessor Sector

"YET ME SUGGEST some mays in which air transport 4 can be made more completely the instrument of "One may is to assume our natural responsibility es a prieste enterprise and to offer the most value to the most people. For example, we of Pen American have chosen to carry the average men for what he con-

"Over a year and a half and, Pan American storted at program for the construction of 50 gious Chapers, dellars. The same Classers, correction over other Page American Armen's roates would provide 24 hours service to Augraba or China, 22 hours to Burnos Array-at comparably low fares. And in fantre years,

all by providing frequent and cheep communication

over neigenel boundaries and between continents -- 50: steaming up the tempo of trade and consiserce all in the remotest land in the remotest and." And thus Mr. Trippe voters the looper and practice of eag of

the great justifutions in an industry destand to play a Titua's is not not dearly defined, butofer core greated baseded by assessed in the years

There are the people senation thanks of when it thicks



### More Air Power for another United Nation

The Brandian Air Force will man not arracalization Breal, under a contract recently skyred by that good neighbor's Government and the Fairchild Engine Bruthmade Banners, to record its six force's

primary moiner, the Fritzbild PT-19, will enable Brund to turn out better offers than ever in an even

Breed Just Renova will also rever Marris M.O. hinknes and Zeneine Grupman Widocons correctly sering service to Bostilian causal natrol. Arracon. Ranger-nowered PT-19's, with "fighter" character-Breet patrol and mail delivery. Thus, to the Branker istics, are ideal for the streamous course of acrobatics Air Arm is added that "touch of tamorrow in the included, today, in practically all United Nations' plenes of today," which characterizes Fairchild planes primary flight training. Unlike the trainers used in and engines everywhere.

the last war, the PT-10 with its Renew cosine, con-

shorter space of time

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AVIATION, Namedon, 2003

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AVIATION, November, 2013



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AVIATION November 1841 ATTATION, Number, 2012



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386



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On all of its maker was common, British is up to or sheed of schedule! Since early at 1941, the reage and values of Briggs war products have constantly More than 22 willian rounds of faithful asserab smerables have been exceed our by Benger in evebambers—base been produced as follows 800,000 pounds as 2941; 7,000,000 pounds in 1943; and 14,000,000 pounds in the first three-quarters of 1943.

SEASON NEWS BROWN

PRODUCTION TENSOR The mouthly production mer on large bomber sermonthly production was in three figures. Today,

SHIPMENTS IN FOUR HOUSES

entr and facilities developed by Britan is the seaso

Design the delays caused by turrer model chapmer ome production of summerable budies and plants mg were are pledged to the purpose of expending was production to speed the day of vacuus So for in 1913, Beiggs has produced review as many BRIGGS MANUFACTURING COMPANY

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AYZATOON, Namedon, 1941



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RCRAFT menglesterers confronted with A removed of grandings, bolts, eats, greats, etc., equipment to solve this problem, and thereby

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AVIATION, Number, 2017

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(LATEON, Number, 196)



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a practical, workable reality. And with success in this endeavor came a fund of special
caseriestes, of the-trail knowledge, that has

Compared with the optical boste radio set protectively acaded in quiet living noon the electronic devices on a bomber feed a dog's life. Their delicem parea or subjected to the jurning coocussion of exploding fak—the "kick-buck" of bussing blockbaseers—who whention of routing means and firing guas... a mailing sewer for even the most rugged pare.

How these sensitive instruments are able to boiled up under such bearing pears sincered is a story that these back to the early days of unscrotive radio. Technicians of Dalos Ralio Local parallel problems—"threaton, electricuted problems—"threaton, electricuterees, bamping and jarring. They faced a set of conditions southy new and different in the rafio feld—the special conditions amonthing "radio in cransis."

sessing and styling. Assumptive radio became

cone in nighty handy in World War II. For Defro Robin oragineen here applied their experience in numerator robin to the nak of giving the forces of freedom—on land, at sea, nath a lim—a strong, clear wore. Delco Robin Division, General Motors Corposions, Kolomo, Indiana.

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That of the to doubt by your about, after, some you say the remort, as by officing posted that make up all and general, present the said of the said o





WHITE PAIN LINE OF THE CO.

See Salving, for Francisco, Selfs.

Printer Service has Manhase State in Leading S.

AVEAUTON, Execution, 8541















Designed entirely on the basis of combat experience, this PSI Mustang is called the "plane without a mistake". As it was planned for speedy production, eggy maintenance and serviceability, RBC Algoraft Needle Bearings with high radial local carrying capacity and small compact size, were the logical choice to accomplish those objectives by providing sense of installation, minimum wear on vital moving parts and peak operating efficiency.

TRENTON .... NEW JERSEY



The manufacture of page blocks has become a family tradition with the Entrone family, Hisser Efficiency, the familier of the Decelors Gage Comments, worked as an appropriate to his father, Hashner Ellisteon when the latter worked on the development of the gage block. This approximathis was served from 1899 to 1994 at which time has father worked in the tool room of the great Swodish Assemil in ill-kaleums and Paporta where the first grade of steel known is used. With this seed at his disposal, the older Diluton contributed to the development of the seed analysis which permits the stability required in page blocks.

Tagether with this development a process of scanning steel was discovered as well as an instruthis day they have no organ in rehability and precision. After baying norm bis early years in the very hirthplace of precision measurement, Elear Effection After having spent his early years in the very Birthplace of precising measurement, return contribute decimal many congressor to received most in the stock-working industry and in 1904 came to the United States where he found employment with large manufacturers as this country, such as August Miror venere or found employment with sarpe menorancement at the country, such to Westerbusso, Mesta Markine Computer, Joseph Rolland Computer and the Maron Bendur

With this wide experience as a background, Elmer Elletrom began his own company in 1996 are with the assistance of his three some, Relph, Olof and Elmer, he has been the Dearleen Gage Yes, the manufacture of gaps blocks is truly "a family tradition" with the Ellerson (assity and it is undealnosity the reason why Dombors Gironium Plated Gaps Blocks are known for their

superfority throughout the world.





AVIATION, Normales, 2045





watablithe to keep his oughness and transparency — thu's Albasete Tracing Paper, Become it is treated with crystal-clear Albasite, a new synthesic solid developed in the KAL lisbocanrier—Albasete will not ordine, become brittle or lose transparency with age. Albastesi's inproved drawing surface takes isk or panel fluories, varsas with use.

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GENERAL CONTROLS

VILTON Named a 190



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ATTATION, Navember, 1945





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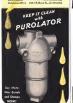
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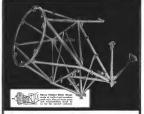
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